

Retrofitting the Green Deal



Association for the
Conservation of
Energy

BioRegional

solutions for sustainability

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BioRegional is an entrepreneurial charity which establishes sustainable businesses and works with partners around the world to demonstrate that a sustainable future can be easy, attractive and affordable. We call our approach One Planet Living.

www.bioregional.com

The Association for the Conservation of Energy represents companies and other organisations engaged in energy conservation. It aims to encourage a positive national awareness of the need for and benefits of energy conservation, to help establish a consistent and sensible national policy and programme, and to increase investment in all appropriate energy saving measures.

www.ukace.org

Foreword

Britain badly needs the Green Deal and the accompanying Energy Company Obligation (ECO) scheme to work, for the sake of the economy, the environment and people's wellbeing. If it succeeds in its big ambition of directing massive private sector investment into energy-saving retrofits in millions of homes and small businesses, it will have cracked one of the hardest of energy conservation nuts.

The Government finds itself under real pressure this autumn from rising household energy bills. A thriving Green Deal, set to help millions of families to cut their gas and power consumption, could have relieved some of that pressure. Instead, Government is considering entirely the wrong response - cutting back on programmes which help the fuel poor to keep warm and ordinary households to cut their energy consumption.

The Green Deal has got off to a painfully slow start. Unless changes are made, the pace will not pick up sufficiently and its potential will remain very far from being fulfilled. The Green Deal itself is in need of an urgent retrofit.

In this report we offer practical, affordable recommendations for such a retrofit which should be implemented relatively quickly. Going with the grain of the Green Deal, our recommendations aim to build on the large amounts of work already done in setting up the scheme.

Success depends, ultimately, on many different businesses, organisations and individuals involved in delivering energy-saving improvements. But Government played the lead role in creating the Green Deal and legislating for it; now it must take the lead in tackling some major shortcomings.

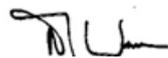
We speak from experience and with a strong desire for the Green Deal to succeed. The member companies of the Association for the Conservation of Energy want to build viable, long term businesses on energy saving retrofits for homes and small businesses.

BioRegional ran one of the Pay As You Save trials, with B&Q and Sutton Borough Council, which helped pave the way for the Green Deal.⁽¹⁾ Working with Cherwell District Council, we have delivered more than 100 Green Deal assessments and are organising Green-Deal style retrofits to 14 homes and small businesses in Bicester, Oxfordshire.

Today's homes and buildings are going to be around for many more decades. We cannot afford for them to carry on wasting warmth on such a huge scale – not if we are serious about cutting carbon, helping families, improving living standards and greening economic growth. We need a Green Deal, now, which can stay the course and make a real impact.



Sue Riddlestone,
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November 2013

Executive summary

Properly executed, the Government's new Green Deal energy saving loan scheme has the potential to transform energy saving in Britain's homes, bringing in big gains to the economy, household budgets and the environment at the same time.

But it has got off to a disappointingly slow start and seems on course to deliver a few tens of thousands of home retrofits a year, at most. Given all of the time and effort that has gone into creating the scheme from government and the private sector and the scale of the original ambition behind it, this is a tiny sum.

The Green Deal ought to be delivering several 100,000 retrofits a year. A goal of more than one million homes per annum would be reasonable given the size of the task of improving the UK's still highly energy-inefficient housing stock.

The benefits in carbon savings, energy bill reductions, maintaining and creating jobs and enhancing welfare and health from this level of retrofits would be enormous.

The most important problem with the Green Deal, as it now stands, concerns a funding gap caused by its so-called 'golden rule' which places limits on how much a household can borrow

under the Green Deal. Most households which might be interested in taking out a Green Deal would find themselves having to pay at least £1,000 upfront.

Green Deal assessments, the starting point for the scheme, need improving and the bulk of them need to be provided free of charge.

We make several recommendations which, taken together, represent a retrofit for the Green Deal – one which would enable it to fulfil its great potential.

The Green Deal interest rate needs to be lowered; we suggest how it could be. We also argue for a government-backed incentive scheme for Green Deal retrofits. This would help to close the Green Deal funding gap, but it would also encourage many households to use the Green Deal as an assurance scheme without having to use Green Deal finance.

We make recommendations for improving the assessment process, for encouraging more small businesses and traders to be engaged in the scheme, and for the Green Deal to have a stronger impact in streets and local communities.

Recommendations

Incentives for retrofits and closing the Green Deal funding gap

1. Government needs to guarantee Green Deal loans so as to reduce the APR to below 4%.
2. Government should assess variable stamp duty and Green Deal grants as incentives for household retrofits, then deploy one or both of these for at least three years.
3. Government should explore the potential for a street-level Green Deal incentive, administered by local councils, aimed at encouraging groups of neighbours to club together in commissioning Green Deal retrofits for their homes.
4. Green Deal incentives along the lines we propose strengthen the case for 'consequential improvements' measures in the Building Regulations. This means that if approval is sought for any alteration or extension which would increase a home's energy demand, then its overall energy efficiency must be improved so as to offset this increase. Home improvements, along with house purchases, are the most important opportunity points for householders to make major energy saving retrofits. Consequential improvements should be brought into the Building Regulations once a Green Deal incentive is deployed.

Bringing more small traders and SMEs into the Green Deal

5. Accredited Green Deal Installers should be able to offer unfinanced (or self-financed) Green Deal packages to households without a Green Deal provider being involved, provided appropriate safeguards are introduced.

On Green Deal assessments

6. The Department of Energy and Climate Change should commission research aimed

at gaining a better fix on the typical energy savings actually achieved by the various Green Deal measures, in kilowatt hour, carbon and money terms. This should then feed into improvements in the modelling and methodology used to make savings estimates in Green Deal assessments.

7. A long-term supply of free assessments should be offered to householders, lasting at least three years and capped in the region of one million assessments a year. This offer should be focused on households that are most likely to benefit from a Green Deal package and most likely to take one out.
8. The Energy Performance Certificate and the Green Deal Occupancy Assessment Advice Report need to be restructured and rewritten so as to align more closely with each other, with clear and simple messages about their purpose and the differences between them. The explanation of 'actual' versus 'typical' estimated savings should be improved, with clearer messages about the likely accuracy of these estimates and what factors determine whether they will be realised.
9. To further improve the accuracy, reliability and credibility of Green Deal assessments:
 - DECC should commission research on an adequate sample of Green Deal assessments, to determine their accuracy and share information on the most common errors and how to eliminate them.
 - If necessary, it should revise the Green Deal Code of Practice to ensure errors in assessment reports are swiftly rectified – by carrying out a second assessment if need be.
 - The typical costs of recommended measures used in all assessment reports should be updated annually.

1. Introduction

A shared vision of a coming revolution for Britain's 27 million homes has formed during the past five years. It was shared by government and a wide range of people, businesses and organisations involved in housing, in promoting local economies and employment, in energy supply and environmental protection.

What did they envisage? A sea change in attitudes and understanding around energy in the home. The nation's enduring (and endearing) love affair with home improvement would come to embrace home energy conservation.

When people bought or rented a dwelling, its energy efficiency would become a key factor in the price they were willing to pay. When they did any kind of renovation or improvement work, from a new kitchen to a loft extension, increasing their home's energy efficiency would be a prime consideration.

Britain's army of local tradespeople – small building firms, plumbers, gas and kitchen fitters – would become energy retrofit ambassadors, with the knowledge, training and contacts to integrate energy efficiency upgrades into other home improvement projects.

Houses and flats would become more like cars: people would pay close attention to fuel economy figures before making a purchase (or deciding to rent), then keep a close eye on energy performance while living in the property.

And so, within a decade, most UK households would have attacked rising gas and electricity bills by radically upgrading their homes with much improved insulation and heating systems, lighting and appliances, and by installing their own renewable and low-carbon energy sources.

The nation's heat-leaking housing stock would thus be transformed, its chronic fuel poverty curbed and tens of thousands of jobs related to home energy use would be protected - or even created - boosting the local and national economy.

Direct and indirect carbon dioxide emissions from energy consumption in homes would fall, easing the burden of complying with the UK's

legal carbon budgets (housing is responsible for nearly a quarter of UK greenhouse gas emissions).

This uplifting vision was propped up by a harsh reality; unit costs for domestic gas and electricity had risen sharply and were likely to keep rising.

Self-interest would transform the vision into substance. Most people would be willing to invest in upgrading their homes' energy efficiency in order to control these rising fuel bills. The exception would be a low income minority lacking savings or the ability to borrow; their home retrofits would have to be financed by taxpayers, or by all energy consumers paying a small levy on their bills.

These kind of redistributive measures were the means by which most of the work on retrofitting the UK's overall housing stock had been financed over the previous two decades, most recently by the Warm Front, Community Energy Saving Programme (CESP) and Carbon Emissions Reduction Target (CERT) schemes. But the thinking, in government and beyond, was that such subsidy schemes were incapable of doing all of the heavy lifting needed to complete the big task of retrofitting Britain's existing homes.

Such schemes had succeeded in insulating millions of lofts and cavity walls across the UK over the past 20 years, plucking much of the low hanging fruit. But not all of it. In any case, lofts and cavity wall insulation represents only a fraction of the total domestic retrofit work which can be justified as cost effective, in that energy bill savings eventually cover the upfront costs of the energy saving measures. (2)

This gap between what has been achieved so far and what ought to be done grows still wider if a cost is put on household CO₂ emissions and if the health and wellbeing benefits which accrue from tackling fuel poverty are factored in.

There was also a consensus that in order to make real progress individual upgrades needed to be bigger, covering the whole house with a package of measures and offering correspondingly larger energy savings.

A long way still to go

The latest English Housing Survey, published in July 2013 and covering the period 2011-12, found:

- 11.5 million homes, 55% of those with central heating boilers, were still lacking the more energy-efficient condensing type of boiler
- At least 8.7 million homes, 37% of those with cavity walls, still lacked cavity wall insulation
- 7 million homes, 31% of the English total, have solid rather than cavity walls, and only some 5% of these have had solid wall insulation installed.
- 8.7 million homes, 48% of those with loft spaces, have less than 150mm of loft insulation. The recommended depth is 270mm
- 2.7 million homes (12%) still have no double glazing or less than half of their windows double glazed
- 36% of England's homes (some 8.3 million) were in the bottom three Energy Efficiency Rating Bands – Bands E, F and G. Only 15% were in bands A-C.

The Committee on Climate Change (CCC) 2013 Progress Report to Parliament finds there are 5-7 million lofts with insufficient levels of insulation and some 4-5 million homes with unfilled cavity wall. There are also some 7-8 million homes with solid walls in need of insulating.

Under its indicators framework, which aims to guide government in cutting emissions and meeting its statutory carbon budgets, the CCC proposes that:

- All remaining lofts and cavity walls be adequately insulated by 2015.
- Insulation of 2.3 million solid walls by 2022.
- Replacement of 12.6 million old, inefficient boilers by 2022

Its indicator trajectory sees direct and indirect emissions from UK homes falling from 134 million tonnes of CO₂ a year in 2012 to 80 million tonnes of in 2022. Improvements in home energy efficiency, alongside decarbonising grid electricity, would have a leading role in delivering those carbon savings.

These bigger retrofits would save more energy but they would also be more expensive. That makes it harder to justify charging all energy consumers a levy in order to finance them. Why should everyone pay when some of the households receiving the retrofits can afford them as well as benefitting from them?

Furthermore, there was always some danger that the money raised by this kind of levy might be poorly controlled and spent badly. Giving away vast quantities of unwanted low energy light bulbs, or even losing millions of them, as E.ON did, became the most notorious example.⁽³⁾

So, some argued, the time was ripe for self interest rather than levy-funded subsidies to become the main engine driving retrofits. But

the big, familiar problem obstructing domestic energy conservation remained. Most households are unwilling or unable to spend significant sums upfront in order to save energy in future.

They can understand the argument for investing £5,000 in a new, high efficiency boiler and controls, topped up loft insulation and cavity wall insulation, in order to cut their gas bill by £500 a year. But few would be willing to write a cheque for it.

Why not? Because these savings lie in the future and may not be as large as promised. And what if they sold their home in a few years and moved out? Someone else would then benefit from the reduced bills.

But the biggest obstacle is the plain fact that £5,000 (or even £500) is a great deal of money for most households. If they had that sum in savings, or could borrow it at a reasonable interest rate, many could find other things of more immediate personal benefit or importance to spend it on.

1.1 Enter the Green Deal

Three key features of the long awaited Green Deal launched by the Energy and Climate Change Department (DECC) in January 2013 (and the similar Pay As You Save scheme which the previous government had begun to work up) were meant to break through these barriers.

Together these three make it a pioneering loan scheme purpose-built for financing home energy retrofits in which the upfront costs are gradually paid off by an extra charge on electricity bills. They are:

1. If a household which has taken out a Green Deal moves out of a property the household moving in takes over the remaining loan payments.
2. The ongoing savings in energy bills should equal or exceed the ongoing costs of the loan repayments so that there is no overall increase in household costs. The Green Deal's 'Golden Rule' tries to cover this.
3. Before deciding whether to enter into a Green Deal, a household needs sound, credible advice and recommendations about what energy saving measures it should install and the costs and likely energy bill savings resulting. It gets this from its own personalised Green Deal assessment. The deal-making process also gives assurances that the installation work will be done well and that there is a means of redress if things go wrong.

But a loan scheme with these three essential features could not, of itself, transform that shared vision of a great national housing retrofit into reality. Some additional mechanisms would be needed. These are provided through the Energy Company Obligation (ECO).

One part of ECO (called 'affordable warmth' and 'carbon saving communities') covers low income households suffering fuel poverty. Many of these

need energy-saving improvements so that the gas and electricity they are struggling to afford actually keeps them warm rather than going to waste. They could not afford to pay off a loan through a charge on their electricity bill.

The other 'carbon reduction' part of ECO tackles measures which deliver major energy and carbon savings but cost so much that they could never meet the Golden Rule. This covers interior or exterior wall insulation for homes with solid walls (lacking heat saving cavities) and insulation for cavity walls that are more difficult, and therefore expensive, to fill.

ECO places an obligation on energy suppliers to deliver target levels of carbon and energy saving, in line with the objectives of reducing fuel poverty and delivering costlier retrofit measures. The energy suppliers are meant to find the cheapest ways of hitting these targets, and they pass costs on to all of their customers.

The hope was that together the Green Deal and ECO would make a big impact on the great national task of retrofitting the UK's housing stock. The remaining low hanging fruit – under-insulated lofts, easy-to-treat cavity walls, old, inefficient boilers – would continue to be plucked. More expensive, less familiar retrofit measures such as solid wall insulation would enter the mainstream. But there were warnings the pace of work would slow compared to that achieved by CESP and CERT.

ECO and the Green Deal form one of main planks in the energy and environment policy platform of "the greenest government ever". Much time and effort has gone into their creation, not only from government and legislators but from private sector organisations, councils and NGOs participating in extensive consultation then gearing up to deliver the Green Deal and ECO.

1.2 A very slow start

The Green Deal is in danger of becoming a major policy failure. If that happens, the cherished vision of a revolution in home energy saving will quickly become a mirage followed by lost years of inaction.

‘The vision for the Green Deal and the new ECO is an ambitious, far-reaching one ... a world where the UK leads with a dynamic new energy efficiency market, with nationwide brands, local businesses and community organisations competing to deliver the best proposition for the consumer.’

DECC consultation on Green Deal, 2011.

At the last general election in 2010 the manifestos of all three main parties promised a Green Deal type scheme. During its party conference in October 2013 Labour announced that, if elected, it would overhaul the Green Deal and replace it with a new but as yet unspecified Energy Save scheme.

The most obvious early sign of things going badly wrong is the very low number of Green Deal plans actually going through in the first eight months of the scheme. According to DECC statistics covering the period up to the end of September 2013, a mere 954 Green Deal plans were underway for individual households. Only 57 had actually been completed, with the installation work signed off and the repayments having begun. (4)

Two years ago, ministers were speaking of 14 million homes being covered by 2020. (5) So a few hundred signing up in the scheme’s first half year is a dismally slow start. DECC has attributed this to Green Deal providers being slow to come forward, with the first of them making finance available to households only from May 2013. But four months on from then, take up remains at a trickle.

The biggest problem to emerge is that the Green Deal finance mechanism can only cover a part (and often the smaller part) of a typical household retrofit. Very often, households will have to find much of the money for the installation themselves, defeating one of the Green Deal’s founding purposes.

Extra loft insulation and regular cavity wall insulation can usually be fully covered by the Green Deal, with projected typical energy bill savings equalling or exceeding the repayments. But other typical retrofit measures frequently recommended in Green Deal assessments, such as replacing a gas-fired central heating boiler with a more efficient model, fall far short of the Golden Rule. Green Deal finance will only cover part of their cost. And the ECO carbon reduction scheme, designed to bridge this kind of funding gap, only applies to a small suite of energy-saving measures; it does not cover boilers.

Furthermore, the types of measures that can be fully financed by the Green Deal tend to be the cheaper ones. But households may be loathe to enter a loan arrangement with an APR of some 8% lasting at least ten years in order to borrow a few hundred pounds.

In general, major retrofit packages costing several thousand pounds will only be part-financeable by the Green Deal. The household would have to provide at least £1,000 to get the package installed, obtained either from savings or another loan. For many, that will be a deal-breaker.

This is the largest of several problems facing the Green Deal. We discuss each of them, and potential solutions and improvements, below.

The intense political controversy of autumn 2013 surrounding fast-rising household energy prices casts a shadow over all of the government’s energy efficiency and low carbon policies. ECO seemed particularly vulnerable after the Prime Minister’s announcement that he wanted to “roll back” green taxation on energy.

Yet DECC’s latest estimate is that ECO is adding only £50 a year, or some 3.5%, to the average household energy bill of around £1,400.(6)

Its predecessor schemes, CEST and CERP, were estimated to be adding £41 to the average annual bill when they ended in 2012. (7) So ECO plays a tiny part in recent big increases in bills.

Whether Government decides to fund ECO through general taxation in future, or leaves it to be funded via energy bills, there is no case for abandoning or cutting back on a scheme which aims to help the fuel poor keep their homes warmer and to help hundreds of thousands of households to cut their carbon emissions.

Our starting point is that we need the Green Deal and ECO to work well. Government must act to prevent all the time, effort and resources expended in creating them going to waste. We share the vision of a great national housing retrofit set out at the beginning of this report.

To get back on track, the Green Deal itself urgently requires a retrofit, one requiring adaptation and fresh thinking but no major legislation. The Government should launch an improved and updated Green Deal in 2014.

Orange ticks and green ticks: the Green Deal funding gap

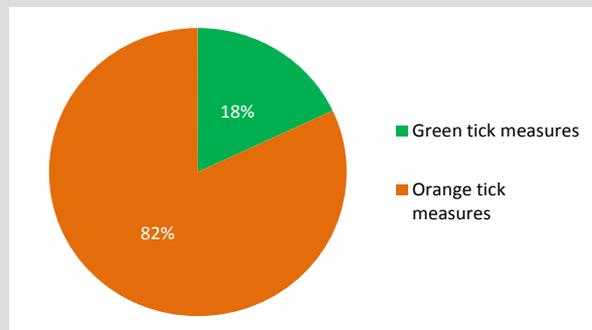
In Green Deal assessment reports, recommended measures that can be fully financed by the Green Deal (typical first year savings equal or exceed first year repayments) are given a green tick. Those that can only be part-financed receive an orange tick, meaning the household would have to make an upfront payment.

Working with Cherwell District Council as part of a project financed by DECC's Green Deal Pioneer Places scheme, BioRegional delivered 103 free-of-charge Green Deal assessments to households, in Bicester, Oxfordshire in the spring of 2013.

A total of 523 measures were recommended in the Green Deal advice reports produced by these assessments – an average of just over five measures per property. Of these 96 (18%) were green tick measures and 427 (82%) were orange tick measures. Furthermore, almost a fifth (19%) of these green tick measures were solid wall insulation (internal or external), which would require ECO funding in order for the household to avoid making a large upfront payment.

The most frequently recommended green tick measure (25% of the 96 recommendations) was for thicker hot water tank jackets, costing a few dozen pounds.

This is a small sample of properties and it was not chosen to be representative.* Even so, the finding that the overwhelming majority of Green Deal recommended measures cannot meet the golden rule will apply across Britain's housing stock. See page 20 for an excerpt from a Green Deal assessment report which illustrates how orange ticks dominate.



Our sample was somewhat more energy efficient than the England average. For energy efficiency rating bands, the distribution was: A&B 1%, C 26%, D 58%, E 12%, F&G 3%. The England distribution for these bands is 0.2%, 15%, 49%, 28% and 8% respectively.

2. Closing the Green Deal funding gap

An example can be used to illustrate and explain this Green Deal funding gap. Installing a new gas-fired condensing boiler might cost £2,200 and promise 'typical' energy bill savings of £100 a year, as set out in the Green Deal advice report following an assessment.

For a typical UK house, £2,200 is at the low end of costs for a boiler installation, while savings of £100 a year are towards the high end of the estimated gas bill savings given in Green Deal advice reports. So, for this example, we have drawn on our experience of Green Deal assessments to use typical figures which tend to minimise the funding gap.⁽⁸⁾

Under the 'Golden Rule' this savings figure of £100 a year sets the maximum repayment that can be made in the first year of the Green Deal finance plan; savings would then equal repayments leaving the household no worse off. (This estimated saving figure relates to a typical household living in that particular property, rather than the actual household. Thus a large family with more than typical energy consumption might obtain higher actual energy bill savings after installing the measure.)

Given this limit on the size of Green Deal repayments, how much money could actually be loaned under the Green Deal? This depends on the interest rate used on the loan and how long the loan lasts.

The Green Deal Finance Company's initial interest rate has been set at 6.96%, but a one off initial loan fee (£63) and an annual finance charge (£20) make the actual APR somewhat higher – the exact figure depends on the size and length of the loan. For this example assume an effective APR rate of 8%.⁽⁹⁾

At that rate, a £100 per year repayment spread over ten years (the minimum Green Deal loan period) would cover a loan of £687. Spread over 25 years (the maximum loan period) it

would cover £1,079. So the householder would therefore have to pay for at least £1,121 (or 51% of the costs of the installation upfront). The Government's temporary Green Deal Cashback scheme would also pay £270 towards the new boiler, reducing this outlay somewhat.

Many have complained that these interest rates are too high and will stifle the Green Deal. So imagine that, instead of an 8% APR, the Government had devised a Green Deal with a 0% APR. For our boiler example above, a £100 a year repayment spread over 25 years would cover the £2,200 boiler cost; it would fail to do so if the loan period was any less than 22 years. If, however, the estimated annual gas bill savings were any less than £88 ($£88 \times 25 = £2,200$) then even a 25 year loan with a zero interest rate would fail to cover the boiler costs. Our experience suggests the estimated typical savings would often be less than £88.

So a long term, interest-free loan would usually fail to close the Green Deal funding gap for a new boiler, one of the most frequently recommended and cost effective of energy saving measures. Add in an interest rate and this gap widens.

The main cause of this funding gap is the small size of the estimated typical energy bill savings achieved by different types of installation relative to their costs. These estimates are based on the Reduced data-input Standard Assessment Procedure (RdSAP) modelling and methodology used to draw up Energy Performance Certificates, with further downwards adjustment to make them err on the side of caution.

These "in use" reduction factors, based on (sometimes limited) data on actual savings delivered by the different energy saving measures, generally cut the energy and bill saving estimates from RdSAP by 15-35%.

This tends to widen the funding gap. It is best that any error should favour caution over excess, in order to avoid promising energy savings which fail to materialise. But the estimates provided to households in Green Deal assessments need to be as accurate and robust as possible.

Recommendation : DECC should commission research aimed at gaining a better fix what on the typical energy savings actually achieved by the various Green Deal measures are, in kilowatt hour, carbon and money terms. This should then feed into improvements in the modelling and methodology used to makes savings estimates in Green Deal Assessments.

But even if improvements in the modelling led to slightly more generous estimates of typical savings, the funding gap would still exist for boilers and several other principal Green Deal measures.

So a choice has to be made. Government could accept that the scheme will be unattractive for the great majority of households, and that the Green Deal was not the solution for retrofitting the nation's housing stock that many hoped it would be.

Alternatively, it could try to recast the Green Deal in ways which make it attractive to millions – rather than thousands – of households.

There are three essential ingredients of such a Green Deal retrofit – **cutting interest rates, encouraging households to enter into the Green Deal without using Green Deal finance and developing a significant, long term incentive for home retrofits.**

2.1 Cutting interest rates

The Government has made major interventions to make it easier for house purchasers and small businesses to borrow money.

Recommendation: Government now needs to guarantee Green Deal loans so as to reduce the APR to below 4%.

This would shrink the funding gap, but in many cases it would not close it entirely. It would, however, give householders a clear signal that this was a government-backed scheme offering a highly competitive loan rate.

The Green Deal Finance Company (GDFC) justifies its relatively high interest rate on the grounds that some 80% of UK households are able to access its Green Deal finance. But that

will not impress the substantial proportion of households who are able to obtain significantly cheaper finance (including via their mortgages) for a wide variety of goods and services. They are likely to see the finance element of the Green Deal as a rather poor deal.

This is not to argue that Government should loan all or most of the Green Deal finance off its own book. It was always intended that Green Deal finance should flow from private sector investors via bond issues. Government needs to work with the finance industry to devise a debt structure with guarantees which will halve the interest rate. The fact that repayments are made through a levy on a property's electricity bills, irrespective of who occupies the property, gives relatively high security.

It is worth noting that both the Government and the state-backed Green Investment Bank have already helped finance the GDFC, but only to ensure it had money to lend for retrofits in its early days. Given the very slow initial demand for Green Deal loan packages, the money raised by the GDFC seems set to last for years.

A long-term element of state backing aimed at bringing down interest rates would leave the Government with additional liabilities. It could contain its exposure through an annual cap placed on the total sum of state-backed Green Deal finance plans. It could also devise a way of focusing these cheap, low interest loans on less affluent households.

For example, there could be a maximum of 500,000 state-guaranteed Green Deal finance plans a year. With an average cost for each of £6,000, the annual expenditure on retrofitting homes would be £3bn but the government's exposure would be a small fraction of this.

Interest rates will have to be lowered if the Green Deal is to succeed as a loan scheme. But it also has the potential to operate as an assurance and help scheme, enabling hundreds of thousands of households a year to install energy saving retrofits without using Green Deal finance.

2.2 Using the Green Deal as an assurance and help scheme

A great deal of effort has gone into creating assurances around the Green Deal. Hence there is the 'Green Deal approved' branding, accreditation processes for Green Deal assessors, providers and installers, a code of practice and an ombudsman. Together, these aim to give households confidence that they will receive:

- Reliable information about the most cost-effective energy saving measures they can install and the likely costs and savings
- Help in finding reliable firms to carry out the installation
- Installations done to a high standard, and reassurance that if anything goes wrong it will be put right.

If the Green Deal succeeds in providing all three it has the potential to be marketed to a segment of households purely as an assurance and help scheme; that segment which can finance a Green Deal package upfront from savings or cheap loans (i.e. via a mortgage). This represents a substantial proportion of the overall customer base. And there are early signs that it is already appealing to this segment.

DECC statistics on the Green Deal showed that 9,087 'Cashback' vouchers had been issued by government by the end of September. These vouchers help pay for the cost of Green Deal installations. To obtain them households must go through the Green Deal process (starting with a Green Deal assessment) but they do not have to take out Green Deal finance. Contrast this figure of more than 9,000 with fewer than 1,000 homes intending to take out Green Deal finance over the same period.

To date, the great majority of households using the Green Deal are keen to take advantage of the Cashback incentive but do not want or need the loan facility. This also demonstrates that incentives can play an important role in generating retrofits.

2.3 The need for additional, enduring incentive schemes

DECC has made it clear from the outset that the Green Deal Cashback is a temporary incentive aimed at 'kick starting' the scheme. Now, however, a more permanent incentive is required to drive domestic retrofits and revive the faltering Green Deal, enabling it to fulfil its economic, social and environmental potential. Without it the scheme is unlikely to reach more than a few 10,000s of homes a year (the ECO scheme will treat more) when it should be improving many hundreds of thousands.

Such an incentive needs to give a strong, clear benefit for improving a home's energy efficiency. At the same time it could:

- Further close the Green Deal funding gap, to make it a more attractive loan product.
- Widen the Green Deal's appeal as a simple assurance and help scheme, in addition to being a loan scheme.
- Emphasise that the Green Deal is a government backed scheme which benefits all of society, not just individual households.

At present, the Green Deal is marketed primarily as a product to benefit households through a commercial deal between them and the private sector. It might have wider appeal if an accompanying message was that the nation and the planet benefit from the Green Deal as well as the individual household.

Each Green Deal installation reduces carbon emissions, helps protect the environment, improves the housing stock and contributes to economic growth and employment. A state-backed incentive would be a reward to households for doing some social good, reinforcing that positive message. This, after all, is the kind of message implicit in the Feed-in Tariff scheme for micro-renewables.

Fresh burdens on the Exchequer will be resisted in a period of austerity and deficit reduction. It is, however, possible to design incentives which are revenue-neutral or near revenue-neutral. In

any case, the increased revenue arising from more Green Deal installations and all the economic activity accompanying them needs to be factored in; VAT, income tax, national insurance payments and corporation tax.

Government needs to consider options and choose the best value incentives, the ones which are most effective at stimulating additional Green Deals and secure the largest energy and carbon savings per pound spent. The chosen incentive can be capped and adjusted periodically, as with Feed-in Tariffs, to limit government exposure, ensure value for money and conserve revenue neutrality.

For example, incentives for less cost-effective measures (in terms of expenditure per tonne of carbon saved) should only be given if the more cost-effective recommended measures are also taken up. A home lacking easy-to-apply and low cost cavity wall insulation would have to have that installed at the same time as having a new high efficiency boiler in order to qualify for incentives for the latter.

A task group set up by the UK Green Building Council considered the question of retrofit incentives in depth, reporting in July 2013. (10) ACE was represented on this task group and this section of our report draws on its work.

The group considered a long list of eight types of incentive, each scored against 14 criteria. Three of the four top scoring types of incentives were then further developed as workable policies and presented to government as recommendations. These three were variable stamp duty (which the Committee on Climate Change has advocated), variable council tax and an energy efficiency Feed-in Tariff. The task group is now asking government to do further work on these proposals and implement at least one of the incentives.

We believe variable stamp duty could provide strong support for a revised Green Deal. We also favour a Green Deal grant which, in essence, would mean that the government's existing Cashback scheme became a more permanent fixture. Such a grant scheme could be seen as one version of an energy efficiency Feed-in Tariff, but with all of the tariff payments lumped into one upfront payment.

Before describing these incentives, we briefly explain the other two incentives proposed by the task group. These may have a longer term role in stimulating energy saving retrofits.

2.3.1 Variable Council Tax

Under this proposal, energy-efficient homes would receive a discount on their council tax while energy-inefficient homes would pay some additional, penalty council tax. The size of this discount or penalty, amounting to the low hundreds of pounds at most, would be based either on the property's SAP points or on its Energy Efficiency Rating Band (A to G). Using the latter would make the discount/penalty more crudely graduated but easier to administer.

Variable council tax would raise awareness of the energy efficiency of homes. It could be made revenue neutral for the councils that run it, with the 'penalty' tax revenue equalling the 'discount' revenue.

However, many homes still do not have a SAP rating and these tend to be more energy inefficient. Some mechanism would be required which applies the discount/penalty to these unrated homes in ways which are justifiable and equitable and which encourages owners to obtain both a rating and an energy saving upgrade. Obtaining a rating requires a stand-alone EPC survey or a Green Deal assessment; both imply a cost.

The impact of a variable council tax on low-income households would also have to be addressed. Those who live in a relatively energy inefficient homes and pay council tax would find their tax bill increasing sharply but be unable to afford the energy saving upgrade required to reduce it. The Green Deal could only help them if the funding gap was closed.

This incentive would also have to be adjusted every few years in order to maintain revenue neutrality. As more and more homes underwent energy saving retrofits and lowered their council tax bill, the SAP score or energy efficiency rating band which served as the neutral balance point (higher scores earn the discount, lower scores face the penalty) would have to be gradually shifted upwards.

2.3.2 Energy efficiency Feed-in Tariff

Regular payments would be made to households for the energy and carbon they saved following a retrofit. These payments for ‘negawatts’ would be based either on estimated (deemed) energy savings or actual, measured savings compared to the household’s baseline energy consumption before the retrofit.

It might be argued that no retrofit was actually required to qualify for this kind of energy efficiency feed-in tariff; instead, a household could simply pledge to cut its energy consumption and be paid according to results. But people could then game the system; parents who knew their grown up children were leaving home could enter the scheme just before they left.

This scheme could be costly – the task group’s modelling suggests a range of £52m to £273m per annum. It would have to be financed by taxpayers or energy bill payers (via a modified ECO scheme), with no prospect of revenue neutrality for the Treasury.

It might be quite difficult to justify such a scheme to the public (who might ask: “Why should taxpayers/energy consumers pay money to people who are already reducing their energy bills?”). The modelled benefits of additional retrofits, GDP and CO2 savings are all rather lower than for variable stamp duty and variable council tax.

However, if the energy efficiency feed-in tariff succeeded in delivering the promised long-term reductions in energy demand, it would cut costs for all energy bill payers by reducing the need to invest in costly new gas and electricity supply infrastructure.

One important point to consider is that neither a variable council tax nor an energy-efficiency feed-in tariff do anything to help close the Green Deal funding gap, because they only offer small but regular payments or discounts after a retrofit rather than upfront.

2.4 Variable Stamp Duty

Under this proposal, people buying a more energy efficient home would receive a discount

on their stamp duty land tax (SDLT) while those purchasing a relatively energy wasteful house would pay extra SDLT; a penalty. This could be used to make this incentive revenue neutral for the Treasury. The size of the incentive/penalty would be based on the property’s SAP rating, as set out in its Energy Performance Certificate.

In a worked example, the task group’s report shows the purchaser of a £280,000 house at the bottom of Energy Efficiency Rating Band D (55 SAP points) having to pay extra ‘penalty’ SDLT of £1,200 above what it would otherwise be (£8,400). In contrast, the purchasers of an energy-efficient, £465,000 new-build home with 84 SAP points in Band B would gain a £2,000 discount on their baseline SDLT of just under £14,000.

The task group’s report shows that such a scheme could be fairly simple to administer. Variable stamp duty would sharply raise awareness of energy efficiency among prospective home buyers, sellers and estate agents. Variable vehicle excise duty (the ‘tax disc’) based on car carbon emissions has already proved itself a successful policy, lowering vehicle fuel consumption and emissions while enjoying public acceptance. The government should take heart and confidence from that.

Variable stamp duty would encourage a small proportion of prospective house sellers to carry out retrofits, in the hope that the resulting SDLT discount would make their home easier to sell at the desired price.

More importantly, it could stimulate many more post-purchase retrofits. The idea here is that house purchasers who chose to improve the energy efficiency of their new home could then claim the appropriate SDLT discount based on their homes’ new, higher SAP rating (provided the retrofit was done within a year of purchase). Home improvement projects often follow a house purchase and these can readily be combined with an energy-saving retrofit in order to minimise disruption and secure savings in the costs of the combined works.

If the SDLT discount proved popular among buy-to-let purchasers, it would help to raise the generally very low energy efficiency standards in the private rented sector.

This variable stamp duty incentive proposal does have some drawbacks. It is only of interest to a segment of households likely to buy or sell a home in the next few years. But this is a large segment, given that more than 900,000 homes are sold in the UK each year.

If, as seems likely, most of the retrofits it stimulates were post-purchase ones that would undermine its revenue neutrality for the Treasury because all these households would claim the SDLT rebate.

Variable stamp duty would be bound to face some opposition; from prospective sellers living in energy-inefficient homes and people wanting to buy older homes, which tend to have lower SAP ratings. Both would be hostile to the penalty side of the scheme. The more the Treasury tried to protect revenue neutrality, the larger this penalty element would have to be.

According to modelling commissioned by the task group, it would stimulate 135,000 to 270,000 additional retrofits a year, increase GDP by £404m to £807m a year and achieve annual CO₂ savings of 209,000 to 417,000 tonnes a year.

Variable stamp duty would stimulate additional retrofits, but it would not of itself close the Green Deal funding gap. In most cases, a newly moved-in household which wanted a Green Deal loan in order to claim a stamp duty rebate would still find itself having to provide part of the finance upfront. But at least it could recover some or all of this initial outlay (and even pay off some of the Green Deal loan early) when the rebate was paid.

2.5 Converting the Cashback into a Green Deal grant

A permanent Cashback scheme (or one that was guaranteed to last for several years) would convert it into a grant scheme helping to finance energy saving retrofits. For households interested in using Green Deal finance, these grants would help close the funding gap created by the Golden Rule.

Such a grant is equivalent to an energy efficiency feed-in tariff discussed above, but paid only

once, upfront. Paying households in return for them delivering long-term reductions in energy demand and carbon emissions has one obvious justification. (11) It can cut costs for all energy bill payers by reducing the need to invest in major new gas and electricity supply infrastructure.

It can also act as a retrofit incentive for those households able to organise their own finance but still wanting to use the Green Deal process to make energy-saving improvements, starting with an assessment. The existing Cashback scheme succeeded in stimulating more than 8,000 of these 'self-financed' Green Deal packages in a few months.

Such a grant scheme offers simplicity in terms of administration and fraud prevention, since it requires only one payment. Grants would only be made to households with retrofits based on Green Deal assessments recommending plausible energy saving installations

As with the existing Cashback, the grant would be based on standard payments for each different type of measure. Within this framework, there is scope to fine tune a Green Deal grant scheme to limit overall costs (by capping total annual expenditure), to maximise cost effectiveness (per unit of energy/carbon saved), to encourage take up by lower income groups and minimise deadweight losses (avoiding paying towards installations which householders would have funded in any case).

For example, the grant might only apply to 'orange tick' recommended measures (see pages 8 and 20) and be paid over only if recommended 'green tick' measures were also installed as part of the package.

Such a scheme could be funded directly by government or via ECO, although the latter seems unlikely given the controversy over fast-rising energy bills. If the grant was applied to 400,000 homes a year, at an average cost of £300 each, total annual expenditure (excluding administration costs) would be £120m. This is close to the £125m set aside for the existing Green Deal Cashback scheme, only a tiny portion of which has so far been spent.

It is also small in comparison with government estimates for the total annual ECO costs of £1.3 bn. The UK Green Building Council's task group did not select a Green Deal grant as among the most promising retrofit incentives. Our view is that it should be a front runner.

Recommendation: Government should assess variable stamp duty and Green Deal grants as incentives for household retrofits, then deploy one or both of these for at least three years.

Government has the resources and the policy appraisal process required to devise an incentive, or combination of incentives, which offers best value for money while securing hundreds of thousands of retrofits each year.

2.6 Sticks and carrots – the case for ‘consequential improvements’

Regulation could also be used to drive household retrofits, at least in theory. The most obvious way to do this would be to compel existing homes to meet minimum energy efficiency standards before going on sale (for example, they would have to be above bands F and G). The Government has said it intends to ensure all private rented properties achieve such minimum standards after 2018.

Such regulatory ‘sticks’ are easier to justify if there are also carrots – incentives of the kind discussed above. Even so, the UK GBC's task group decided that introducing minimum legal energy efficiency standards for existing homes at point of sale was a political impossibility. That judgement is sound.

There is, however, one regulatory ‘stick’ driving retrofits which the Government had intended to deploy but then abandoned. This is the so-called ‘consequential improvements’ measures which would have been part of the latest revision of Part L of the Building Regulations covering energy conservation. For several successive revisions of the regulations, governments have begun considering such measures then decided not to proceed with them.

In essence, the proposal is that when a home undergoes significant building work which, all things being equal, would raise its energy consumption, then the entire property would have to meet minimum energy efficiency standards in order to receive the building regulations approval required for the work. For example, the fabric of a proposed extension would have to comply with building regulations and the rest of the house would also have to be improved (the consequential improvements) if, say, it lacked adequate loft insulation or cavity wall insulation.

This is a way of controlling the rise in energy demand and carbon emissions caused by home improvements. But it would tend to increase the upfront cost of major home improvement projects – hence hostile press campaigning against a “conservatory tax” which persuaded government to drop the proposal.

The Green Deal offers a way round the problem. A Green Deal loan could cover any extra costs resulting from “consequential improvements” and leave the household no worse off provided the annual energy bill savings resulting from the overall retrofit equalled or exceeded the annual Green Deal repayment.

But this will not always be the case with the Green Deal in its present form, because of the funding gap issue outlined in this report. What is needed is an incentive to close that gap.

Recommendation: A Green Deal incentive along the lines we propose would strengthen the case for ‘consequential improvements’ measures in the Building Regulations. This means that if approval is sought for any alteration or extension which would increase a home’s energy demand, then the overall energy efficiency of the property has to be improved in order to offset this increase. Home improvement works, along with house purchases, are the most important opportunity points for householders to make major energy efficiency improvements. Consequential improvements should be introduced into the Building Regulations once a Green Deal incentive is deployed.

3. Further opportunities and better assessments

There are several other ways in which the Green Deal could be improved in order to fulfil its potential.

3.1 Increasing opportunities for smaller traders

It was always hoped that the Green Deal would provide abundant additional work for small firms and sole traders – builders, plumbers, glazing installers, electricians and so on. Having obtained the necessary Green Deal accreditation, they would become Green Deal installers and carry out the bulk of the energy efficiency retrofits across the UK.

However, these Green Deal installers need to be linked to Green Deal providers, the larger (generally) organisations which draw up Green Deal finance plans and sign agreements with individual households. Installers cannot offer Green Deal packages on their own.

But it is now clear that many of the households who might benefit from the Green Deal will not want to opt for Green Deal finance. And if households choose not to use this finance, then they should not be compelled to use a Green Deal provider for their package. Instead, they should be able to deal direct with accredited Green Deal installers. This would encourage small traders to market unfinanced Green Deals, along with any government-backed incentive, direct to potential local customers.

Small traders should be able to improve their own margins on Green Deal work as a result of this freedom. This change might also encourage many more of them to be interested in the scheme, and to make links with (or become) Green Deal assessors. Green Deal providers would still be free to offer unfinanced as well as financed Green Deal packages.

Some safeguards are necessary. Households choosing to deal direct with an installer would still have to obtain a Green Deal assessment as

a first step. And an installer acting without a Green Deal provider would be obliged to offer the same level of assurance, guarantees and means to address complaints and resolve disputes as a provider.

Recommendation: Accredited Green Deal installers should be able to offer unfinanced Green Deal packages to households without a Green Deal provider being involved, provided appropriate safeguards are introduced.

3.2 The Green Deal street by street

If several households in one street took out a Green Deal at the same time, this could offer them several advantages.

- They could share information with each other about retrofits – the various possible measures and likely costs and benefits, all the more so if they had the same type of house.
- They might be able to bargain as a group with Green Deal installers/providers, obtaining a better price for the work.
- Working on several properties in one location, either simultaneously or sequentially, would provide the installer with economies of scale and continuity of work, in turn allowing better margins and/or lower prices.

Recommendation: Government should explore the potential for a street-level Green Deal incentive, administered by local councils, aimed at encouraging groups of neighbours to club together in organising Green Deal retrofits.

DECC has made a start with its £20m Green Deal Communities scheme launched in July 2013. It needs to build on the learning from this in 2014. (12)

3.3 Free Green Deal assessments

A Green Deal assessment, carried out by a certified assessor who visits the property, is the

essential first step in obtaining a Green Deal. This tells a household how energy efficient their property is and recommends a range of energy saving improvements tailored for that property. It provides estimates of the costs of these improvements, how much they would reduce a typical household's energy bills by, and whether those costs could be entirely covered by Green Deal finance.

Households are generally charged at least £100 for assessments. This is a reasonable sum given that a visit by a trained and certified assessor lasts some two hours and that travel costs and other overheads must also be covered.

The government had hoped that many assessments would be offered free of charge via Green Deal Provider organisations, which could then cover this cost through their margins on Green Deal installations subsequently sold.

To date there is little sign of this happening. The cost of Green Deal assessments is a major barrier to households commissioning them.

Recommendation: A long-term supply of free assessments should be offered to householders, lasting at least three years and capped in the region of one million assessments a year. This offer should be focused on households that are most likely to benefit from a Green Deal package and most likely to take one out.

The costs of such a programme, at around £100m a year, are significant – but small compared to the overall costs of the ECO, estimated at £1.3bn a year by government (and rather more by several major energy companies). Furthermore, even if as few as only one in eight of the households assessed went on to have a retrofit, this free assessment programme would still deliver relatively low cost carbon savings. (13) A DECC-commissioned survey in the spring of 2013 on households which had received early Green Deal assessments found 49% of respondents claimed to have installed an energy saving measure following their assessment. (14)

Free assessments could be funded by the ECO with the energy companies obliged to deliver them under a scheme which gave them strong incentives for good outcomes (high

quality assessments with a high likelihood of leading on to a Green Deal installations) and which penalised them for bad outcomes (poor assessments, few installations). Alternatively government could fund them directly, choosing a single or multiple contractors (which might include local authorities) to deliver the free assessments through a process of tender.

3.4 Improving Green Deal Assessments

Green Deal assessments have been designed to provide information to households in a highly standardised form covering:

- the energy efficiency performance of the fabric of the home and its heating system
- the energy consumption and bills of the household (in absolute terms and relative to a typical household occupying that type of home)
- estimates of the savings a typical household would make after installing the various energy saving measures recommended
- estimates of the savings the actual household will make
- messages about cost-free and easy-to-make energy savings, such as closing curtains at night and turning off appliances on stand by

The assessment reports provide this information, but in ways which are not always easy for ordinary people, lacking any training in energy efficiency, to understand. After commissioning 103 free Green Deal assessments in Bicester, BioRegional and Cherwell District Council ran drop-in sessions to help people understand their assessments and what they might do next. We found such help was needed and welcomed.

Taken together, the two documents appear to be a case of a committee tasked to design a horse and devising a camel instead. Householders might reasonably ask:

1. Why do I receive two reports - an Energy Performance Certificate and a Green Deal Occupancy Assessment Advice Report (GDOA)?
2. Why do these two reports give different figures for my energy costs?
3. Why do they give different figures for the savings which would result from installing the recommended measures?

Brief explanations are offered in the text of these reports, but even if households read these they may be none the wiser. They might benefit from being 'walked through' the two completed reports by their Green Deal assessors (as BioRegional and Cherwell District Council did with our drop-in sessions in Bicester). However, these documents are written and sent to households after the assessor's visit; a second, explanatory visit is not part of the package.

The most striking difference between the two documents concerns the figures for typical annual savings resulting from the various energy saving measures proposed. As discussed above (page 10), the savings figures in the GDOA report are lower than in the EPC having been (as the EPC text puts it), "adjusted downwards [as]...a precautionary step to reflect variation in buildings, products and installation techniques". They err on the side of caution, but in doing so they only widen the funding gap discussed earlier in this report.

Recommendation: These two different reports need to be restructured and rewritten so as to align more closely with each other, with clear and simple messages about their purpose and the differences between them. The explanation of 'actual' versus 'typical' estimated savings should be improved, with clearer messages about the likely accuracy of these estimates and what factors determine whether they will be realised.

There have also been early problems with assessment quality. Some households have found obvious errors in their assessment reports. BioRegional came across this problem in a small proportion of the Green Deal assessments we and Cherwell District Council delivered in Bicester.

A small survey by Which? magazine, in which five different companies were asked to carry out a Green Deal assessment on the same property, found significant errors for three of the five.(15)

Some misinformation is also built into the system. For example, the standard formula used for calculating costs of photovoltaic panels for all assessments is out of date; it does not reflect recent sharp reductions in PV costs.

Householders must receive reliable, accurate and credible information in their Green Deal assessments because they form the basis for an important financial decision. No system can be devised which will totally guarantee the quality of this information every time, but people do need to know that errors will be put right – quickly and at no extra cost.

Earlier in this report we recommended that DECC should commission research aimed at getting a better fix on the typical energy savings actually achieved by the various Green Deal measures. This should then feed into improvements in the modelling used to make savings estimates.

There is a need, then, for the Green Deal assessment process to be reviewed and improved in the light of early experience - including the accreditation process and certification bodies, the training of assessors and the software and modelling they use.

Recommendation: To further improve the accuracy, reliability and credibility of Green Deal assessments:

- **DECC should commission research on completed Green Deal assessments, to determine their accuracy and share information on common errors and how to eliminate them.**
- **If necessary, it should revise the Green Deal Code of Practice to ensure errors in assessment reports are swiftly rectified – by carrying out a second assessment if need be.**
- **The typical costs of recommended measures used in all assessment reports should be updated annually.**

4. Conclusions and recommendations

The Green Deal scheme has got off to an extremely slow start. If Britain's millions of energy-wasting homes are to cut their bills and carbon emissions then we need to be thinking in terms of a home being retrofitted every minute or so. We seem on course to have one or two retrofits every hour.

The fundamental problem is a funding gap. Most households which might be interested in a Green Deal would find themselves having to pay at least £1,000 upfront.

In its 2013 Progress Report to Parliament the Committee on Climate Change (CCC) warned there was a "significant risk" of progress on improving the energy efficiency of UK housing slowing down and falling short in its contribution to meeting statutory carbon budgets. (16)

In particular, the CCC shared widespread concerns that work on insulating cavity walls and lofts would slow down due to the shift in policy from subsidy schemes like CERT to the Green Deal. As a consequence, much of the cheapest and easiest energy-saving opportunities for UK housing would remain unexploited. The committee called on government to carry out an early review of the Green Deal and ECO, and consider further retrofit incentives.

The early statistics for Green Deal uptake bear out these concerns, and make a review more urgent.

More than carbon savings are at stake. If there were several hundred thousand retrofits a year for a decade or more, the economy, employment and the Exchequer would all gain – and so would millions of households enjoying warmer homes and a long-term cut in their energy bills.

We make the following recommendations for retrofitting the Green Deal. They should enable it to fulfil its potential and transform the UK's housing stock.

Incentives for retrofits and closing the Green Deal funding gap

1. Government needs to guarantee Green Deal loans so as to reduce the APR to below 4%.
2. Government should assess variable stamp duty and Green Deal grants as incentives for household retrofits, then deploy one or both of these for at least three years.
3. Government should explore the potential for a street-level Green Deal incentive, administered by local councils, aimed at encouraging groups of neighbours to club together in commissioning Green Deal retrofits for their homes.
4. Green Deal incentives along the lines we propose strengthen the case for 'consequential improvements' measures in the Building Regulations. This means that if approval is sought for any alteration or extension which would increase a home's energy demand, then the overall energy efficiency of the property has to be improved in order to offset this increase. Home improvement works, along with house purchases, are the most important opportunity points for householders to make major energy efficiency improvements. Consequential improvements should be introduced into the Building Regulations once a Green Deal incentive is deployed.

Bringing more small traders and SMEs into the Green Deal

5. Accredited Green Deal installers should be able to offer unfinanced Green Deal packages to households without a Green Deal provider being involved, provided appropriate safeguards are introduced.

On Green Deal assessments

6. DECC should commission research aimed at gaining a better fix on the typical energy savings actually achieved by the various Green Deal measures, in kilowatt hour, carbon and money terms. This should then feed into improvements in the modelling and methodology used to make savings estimates in Green Deal assessments.
7. A long-term supply of free assessments should be offered to householders, lasting at least three years and capped in the region of one million assessments a year. This offer should be focused on households that are most likely to benefit from a Green Deal package and most likely to take one out.
8. The Energy Performance Certificate and the Green Deal Occupancy Assessment Advice Report need to be restructured and rewritten so as to align more closely with each other, with clear and simple messages about their purpose and the differences between them. The explanation of 'actual' versus 'typical' estimated savings should be improved, with clearer messages about the likely accuracy of these estimates and what factors determine whether they will be realised.
9. To further improve the accuracy, reliability and credibility of Green Deal assessments:
 - DECC should commission research on an adequate sample of Green Deal assessments, to determine their accuracy and share information on the most common errors and how to eliminate them.
 - If necessary, it should revise the Green Deal Code of Practice to ensure errors in assessment reports are swiftly rectified – by carrying out a second assessment if need be.
 - The typical costs of recommended measures used in all assessment reports should be updated annually.

GREEN DEAL Occupancy Assessment

Improvements recommended on the EPC

Improvements	Estimated costs	Your household's estimated annual savings	Expected Green Deal repayment in year 1	Green Deal finance
Increase loft insulation to 270 mm	£100 - £350	£17	£21	✓
Floor insulation	£800 - £1,200	£59	£72	✓
Low energy lighting for all fixed outlets	£25	£34	£15	
Heating controls (thermostatic radiator valves)	£350 - £450	£14	£16	✓
Replace boiler with new condensing boiler	£2,200 - £3,000	£96	£122	✓
Solar water heating	£4,000 - £6,000	£25	£35	✓
Solar photovoltaic panels, 2.5 kWp	£9,000 - £14,000	£239	£236	✓
Total	£16,475 - £25,025	£486	£517	

In this typical Green Deal assessment, only one of the seven recommended measures gets a green tick. See also page 8.

End notes

1. BioRegional, B&Q, Sutton Borough Council, 2011, Helping to inform the Green Deal: green shoots from Pay As You Save.
2. See Building a low carbon economy - the UK's contribution to tackling climate change, the Committee on Climate Change, 2008, pp 216-237.
3. See www.ofgem.gov.uk/press-releases/e-pay-3-million-package-over-inaccurate-reporting-energy-saving-light-bulbs
4. See www.gov.uk/government/publications/green-deal-and-energy-company-obligation-eco-monthly-statistics-october-2013
5. See www.gov.uk/government/speeches/greg-barker-speech-green-deal-and-big-society-event
6. Energy Company Obligation Delivery Costs, DECC, October 2013, see www.gov.uk/government/publications/energy-company-obligation-eco-delivery-costs
7. Estimated impacts of energy and climate change policies on energy prices and bills, DECC, Nov 2011, page 78
8. Replacing an existing gas-fired boiler with a new condensing gas-fired boiler was a recommended measure in 60 of the 103 domestic Green Deal assessments commissioned by the Bicester Green Deal project. For all but two of these recommended boiler installations, the cost was put at £2,200-£3,000; in our worked example we opted for the bottom end of the range. As for the estimated typical annual energy bill savings resulting from the installation, the mean was £82.29 with £100 savings being exceeded in only 32% of cases. Thus our worked example figure of £100 a year savings is fairly generous.
9. The effective APR will depend on the length and size of the loan. The Green Deal Finance Company has cited "all-in costs" ranging from 7.67% for a £5,000 loan over five years to 9.34% for a £1,500 loan for 25 years, if all of its charges were passed on to customers by the Green Deal provider - press release of 25 January 2013, Green Deal Finance Company launches competitive finance available to all.
10. See www.ukgbc.org/resources/publication/uk-gbc-task-group-report-retrofit-incentives
11. Eyre, N., 2013, Energy saving in energy market reform - The feed-in tariffs option, Energy Policy 52 (2013) 190-198
12. See www.gov.uk/government/news/20m-to-help-local-communities-benefit-from-green-deal
13. A Green Deal package which reduced a typical household's annual gas consumption of 16,500 kilowatt hours (Ofgem's current 'medium' figure) by 20% (by 3,300 kilowatt hours) would save 0.606 tonnes of carbon dioxide per annum (using the Government's conversion factor of 0.184 kg CO₂ emitted per kilowatt hour of natural gas combusted). This equates to 12.1 tonnes saved over a 20 year lifetime for the package. In this example, if there was a one in eight success rate in converting free Green Deal assessments (each costing £100) into Green Deal packages which would not otherwise have taken place, the implied cost of carbon abatement is £66 per tonne.
14. See www.gov.uk/government/publications/green-deal-assessment-survey-wave-2-summary-report
15. Green Deal or no deal?, pp 28-31, Which? magazine, August 2013
16. Meeting carbon budgets – 2013 progress report to Parliament, the Committee on Climate Change, www.theccc.org.uk/publication/2013-progress-report/

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